COURSE DESCRIPTION CARD - SYLLABUS

Course name

Chemistry

Course

Field of study

Safety Engineering

Area of study (specialization)

-

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

I/1

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

30

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

5

Lecturers

Responsible for the course/lecturer:

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Wydział Technologii Chemicznej

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Responsible for the course/lecturer:

Prerequisites

1. Student has knowledge of chemistry acquired in high school, necessary to formulate and solve simple tasks in the field of chemistry

2. The student knows how to analyze the phenomena occurring around him.

The student is able to assess situations in which it is located

3. The student is aware of the limitations of their own knowledge and understands the need for further education

Course objective

Systematize and broaden the knowledge of chemistry, acquiring the ability to identify, anticipate and reduce potential or existing hazards arising from the use of chemicals

Course-related learning outcomes

Knowledge

1. The student has the knowledge of chemistry appropriate to the studied field useful for formulating and solving simple exercises in the field of the field of study

Skills

1. Student is able to obtain, integrate, interpret information from literature, databases and other properly selected sources, also in English in the field of chemistry; and to draw conclusions and formulate and justify opinions

2. Student knows how to create well documented elaboration of problems in the field of chemistry in Polish and English

3. Student is able to plan and conduct experiments, including measurements, interpret obtained results and draw conclusions

Social competences

1. The student is aware of the importance and understands the non-technical aspects and effects of chemical compounds, including their impact on the environment and the associated responsibility for their decisions

2. The student is aware of the responsibility for own work and readiness to comply with the principles of teamwork and taking responsibility for jointly performed tasks

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lectures end with a written exam checking the level of understanding of acquired knowledge and the ability to draw conclusions.

Laboratories: Each experiment is preceded by verbal or written verification of the acquisition of the theoretical foundations necessary for understanding a given instrumental method.

Programme content

Lectures: During the series of lectures, the basics of inorganic chemistry will be presented, including acid-base reaction, redox reactions, electrochemical corrosion of metals and methods of protection against it, complex compounds, sedimentation, characteristic reactions of inorganic cations and anions

The risk related to exposure to chemical substances (elements of toxicology) will also be discussed - identification and classification of hazards, familiarization with the construction and information contained in the Material Safety Data Sheets (in particular H-phrases and P-phrases),

Laboratories: The cycle of practical classes consists of eleven laboratory exercises covering the basic issues presented during lectures:

1. pH scale

2. Reaction in the acid-base system

3. pH of aqueous solution

4. The properties of the coordination compounds I

5. The properties of the coordination compounds II

6. Oxidation and reduction reactions I

7. Oxidation and reduction reactions II

8. The separation of substances by precipitation

9. Deterining the accuracy and precision of automatic pipette measurement

10. Qualitative analysis of cations

11.Qualitative analysis of anions

Teaching methods

Lecture: multimedia presentation and discussion of examples

Laboratory course: performing experiments using instrumental techniques - practical classes

Bibliography

Basic

1. Bielański A., Podstawy chemii nieorganicznej, Wyd. Naukowe PWN, Warszawa, 2008, Tom 1 i 2.

2. Jones L..,Atkins P.W., Chemia ogólna. Cząsteczki, materia, reakcje, Wyd. Naukowe PWN, Warszawa, 2009.

3. Minczewski J., Marczenko Z., Chemia analityczna, Wyd. Naukowe PWN, Warszawa, 2007, Tom 1 i 2.

4. MCMurry J., Chemia organiczna, Wyd. Naukowe PWN, Warszawa, 2009, Tom 1-5.

Additional

1. A. Ciszewski, M. Baraniak, Aktywność chemiczna i elektrochemiczna pierwiastków w środowisku wody, Wydawnictwo PP, Poznań 2006

2. F.A. Cotton, G. Wilkinson, C. Murillo, M. Bochmann, Chemia nieorganiczna. Podstawy, PWN, Warszawa 1995

3. G. Charlot, Analiza nieorganiczna jakościowa, PWN, Warszawa 1976

4. M.J. Sienko, R.A. Plane, Chemia. Podstawy i zastosowania, WNT, Warszawa 2002

5. G.W. van Loon, S. J. Duffy, Chemia środowiska, PWN, Warszawa 2008

6.Kowal R., Bezpieczeństwo i higiena pracy przy stosowaniu substancji i preparatów chemicznych, Ośrodek Szkolenia PIP, Wrocław ,2006.

7 Wasilewski M., Dawydow W., Bezpieczeństwo w pracowni chemicznej, Wyd. Naukowo-Techniczne, Warszawa,2008.

Breakdown of average student's workload

	Hours	ECTS
Total workload	120	5,0
Classes requiring direct contact with the teacher	60	2,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	60	2,5

[1] delete or add other activities as appropriate